

## ***Interactive comment on “Challenges in retrieving stratospheric aerosol extinction and particle size from ground-based RMR-LIDAR observations” by Jacob Zalach et al.***

**Jacob Zalach et al.**

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With this comment we would like to respond to the comment published by anonymous reviewer #1 on 05 September 2019.

We are sorry that the essential aspects of our work were not clear to the reviewer. So we would like to clarify these. The described methodology may be a standard approach for tropospheric aerosol studies, but it has essentially never been applied to study stratospheric aerosols. The novelty of the work is that the method is applied to stratospheric aerosols. And given (a) the large differences in stratospheric aerosol size published in earlier studies and (b) the overall importance of stratospheric sul-

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fate aerosols (particularly of volcanic origin) for climate, we strongly believe that the manuscript is of relevance for the community and worth to be published. We think that the reviewer's main argument (nothing new) is not applicable to our manuscript.

Furthermore, most studies on lidar measurements of stratospheric aerosols assume a value of the lidar ratio, i.e. implicitly assume specific values of the particle size distribution. This is not necessary with the method presented in our paper, because the particle size is retrieved in a first step, followed by the retrieval of aerosol extinction.

We also would like to emphasize, that the described methodology can be applied to measurements with any Rayleigh/Mie/Raman lidar with sufficient data quality and measurements at 387, 608, 532, 1064 nm.

We will respond to the specific points raised by the reviewer in the near future.

With kind regards,

Jacob Zalach on behalf of all authors

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